

NuTRoNS: Nucleonica Training on Nuclear Science

MEL Monaco, 15th October 2010

Using webGraph in Nucleonica

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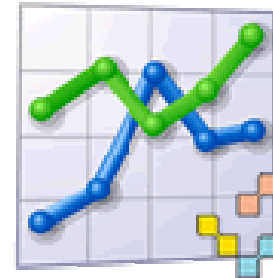
Consultant



webGraph in Nucleonica

Graphics module in Nucleonica:

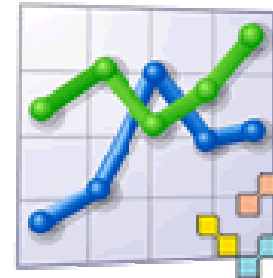
- Easy to use
- Publication quality scientific graphics
- Save data and configuration as XML file
- Save graph in various formats (jpg, gif, png...)
- Often used in many other applications



webGrah in Nucleonica

1. webGraph overview

1. Graph settings
2. Data input
3. Up- and download data files
4. Download graph (Image format)



2. Exercise

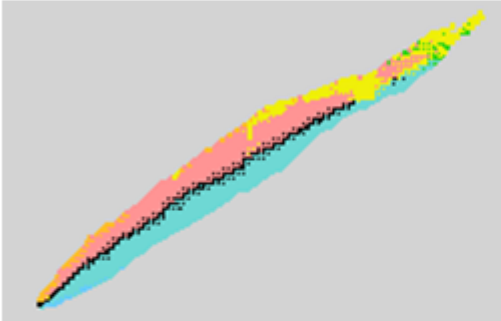
Go to webGraph

Logged in as: rdf Networking **Nuclear Science** Search Forum Calculator Privacy Legal Logout

nucleonica ... web driven nuclear science

Applications Data Knowledge My Preferences Help New Browser **New Alerts**

► Nuclide Explorer



» Actual Chart: Karlsruhe

► Search Nucleonica Documentation

► Nuclear Data Retrieval

► Application Centre

- » Mass Activity Calculator
- » Decay Engine
- » Dosimetry & Shielding
- » Range & Stopping Power
- » webKORIGEN
- » Decay Engine for Large Nuclide Sets
- » Universal Nuclide Chart
- » Transport & Packaging
- » Nuclide mixtures
- » Nucleonica Scripting
- » Library creation for 3rd party software
- » Gamma Spectrum Generator
- » Gamma Spectrum Generator Pro
- » easy Monte Carlo
- » Cambio file Converter
- » WESPA
- » Gamma Library
- » **webGraph**

Welcome, F.Ray

[My Settings](#)
[Networking](#)

► My Last Nuclides

- ⊗ 20 Ca40
- ⊗ 19 K40
- ⊗ 102 No259
- ⊗ 10 Ne28
- ⊗ 5 B13

► My Nuclide Mixtures

- 📖 My Uranium
- 📖 My U232+Co60 Mixture
- 📖 U232+Co60
- 📖 Decay of 1 Grams of 37 Rb 81 after 10 Hours
- 📖 Natural Uranium

► My Sources

► My Messages

webGraph: Options

Default graph size from user Settings

webGraph

Questions, remarks, suggestions can be posted in the [forum](#)

Step 1: Options Step 2: Data Step 3: Graph

General Graph Settings

Image Width: Image Height:

Line Style:

☒ Border
☒ Graph Border
☒ Show Legend

Axes

Axis	Type	Min	Max
Y	<input checked="" type="radio"/> linear	<input type="text" value="0"/>	<input type="text" value="1"/>
	<input type="radio"/> log	<input checked="" type="checkbox"/> Auto scale Y	
X	<input checked="" type="radio"/> linear	<input type="text" value="0"/>	<input type="text" value="1.2"/>
	<input type="radio"/> log	<input checked="" type="checkbox"/> Auto scale X	

Titles

Graph Title:

Category (X):

Value (Y):

Gridlines and Ticks

Category (X) Axis	Value (Y) Axis
<input checked="" type="checkbox"/> Major Gridlines	<input checked="" type="checkbox"/> Major Gridlines
<input type="checkbox"/> Minor Gridlines	<input type="checkbox"/> Minor Gridlines

Ticks Location:

☐ Outside scale ☒ Inside scale ☐ Through scale

Tick Steps:

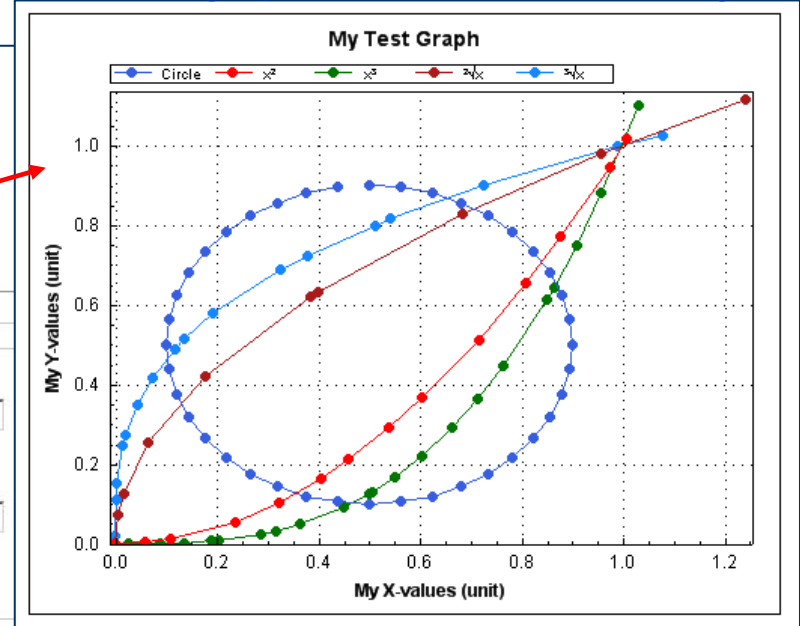
X Axis: Major Step Minor Step

☒ Auto set steps

Y Axis: Major Step Minor Step

☒ Auto set steps

Please select a configuration file:



Graph Style:

- Column
- Line
- Line with Symbols
- Symbols only

webGraph: Data Input

Step 1: Options **Step 2: Data** Step 3: Graph

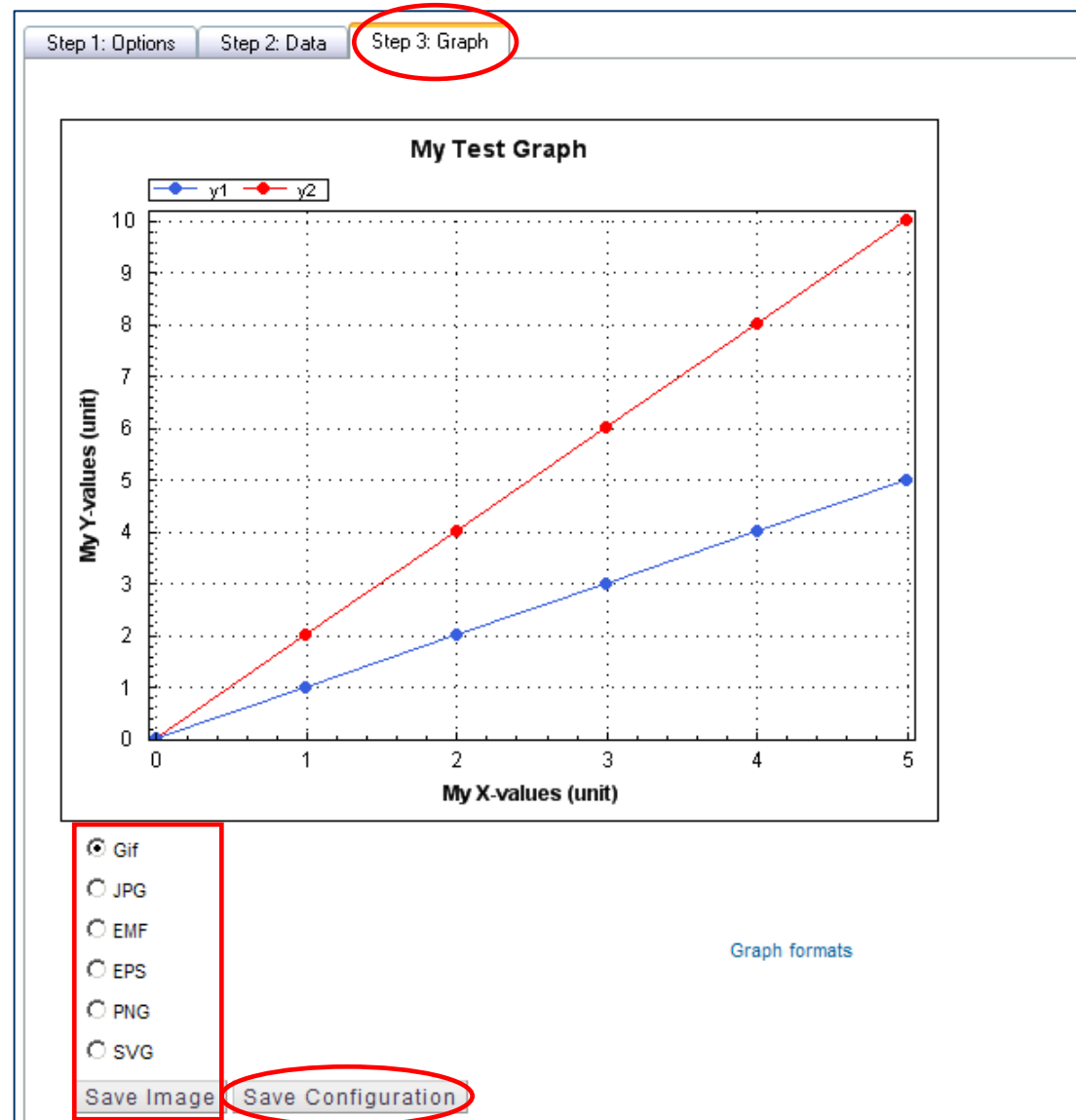
x	y1	y2
0	0	0
1	1	2
2	2	4
3	3	6
4	4	8
5	5	10

- Click into the data input area
- Delete the default data (Ctrl-A and Del)
- Enter your own graph data:
 - Header line (column title)
 - One *common* X-value column and
 - One Y-value column for each curve
 - Columns separated by Comma

Curve interpolation:
☒ Linear
☐ Polynomial

Please select an Excel file:

webGraph: the resulting Graph



webGraph: Image Formats

Graphic Formats used in Nucleonica:

- GIF: Graphic Interchange Format, for graphics with a maximum of 256 colors (8 bits per pixel). Lossless but low compression factor. Can store multiple images shown as animation by browsers.
- PNG: Portable Network Graphics, for color graphics with up to 48 bits/pixel. Lossless compression in general better than GIF.
- JPG: Joint Photographic Expert Group, for images and photos, good but not lossless compression involving decreasing quality with increasing compression factor.
- EMF: windows Enhanced Metafile Format, vector graphic for clipart and illustrations. Perfect for MS Office.
- EPS: Encapsulated PostScript File graphic format.
- SVG: Scalable Vector Graphics; requires Adobe SVG Viewer.

webGraph: Default Data

Step 1: Options **Step 2: Data** Step 3: Graph

→

Circle,	Circle,,	x,	x ² ,,	x,	x ³ ,,	x,	$2\sqrt{x}$,,	x,	$\sqrt[3]{x}$
		0.000,	0.0000,,	0.000,	0.0000,,	0.000,	0.0000,,	0.000,	0.0000
0.5000,	0.9000,,	0.069,	0.0048,,	0.028,	0.0000,,	0.006,	0.0759,,	0.000,	0.0119
0.5626,	0.8951,,	0.158,	0.0251,,	0.066,	0.0003,,	0.040,	0.2001,,	0.001,	0.0998
0.6236,	0.8804,,	0.231,	0.0532,,	0.136,	0.0025,,	0.113,	0.3359,,	0.005,	0.1725
0.6816,	0.8564,,	0.272,	0.0737,,	0.177,	0.0056,,	0.192,	0.4386,,	0.011,	0.2228
0.7351,	0.8236,,	0.357,	0.1273,,	0.221,	0.0108,,	0.296,	0.5438,,	0.030,	0.3107
0.7828,	0.7828,,	0.460,	0.2115,,	0.279,	0.0218,,	0.467,	0.6831,,	0.031,	0.3145
0.8236,	0.7351,,	0.531,	0.2825,,	0.307,	0.0289,,	0.692,	0.8318,,	0.057,	0.3846
0.8564,	0.6816,,	0.600,	0.3598,,	0.369,	0.0501,,	0.787,	0.8869,,	0.108,	0.4760
0.8804,	0.6236,,	0.725,	0.5259,,	0.422,	0.0751,,	1.108,	1.0526,,	0.141,	0.5210
0.8951,	0.5626,,	0.808,	0.6535,,	0.461,	0.0978,,			0.181,	0.5652
0.9000,	0.5000,,	0.907,	0.8230,,	0.502,	0.1266,,			0.279,	0.6537
0.8951,	0.4374,,	0.978,	0.9570,,	0.588,	0.2031,,			0.403,	0.7389
0.8804,	0.3764,,	1.017,	1.0353,,	0.623,	0.2423,,			0.520,	0.8043
0.8564,	0.3184,,			0.691,	0.3305,,			0.589,	0.8382
0.8236,	0.2649,,			0.723,	0.3781,,			0.721,	0.8968
0.7828,	0.2172,,			0.762,	0.4433,,			0.964,	0.9879
0.7351,	0.1764,,			0.827,	0.5661,,			1.104,	1.0336

Curve interpolation:
☒ Linear
☐ Polynomial

Please select an Excel file:

Independant curves with different x-values:

- 1 column pair (x,y) per curve
- Comma as column separator
- 1 empty column between 2 curves (empty comma pair)
- Header line:
 - X-axis title not used
 - Y-axis title as curve legend

webGraph: Upload Excel Data

Step 1: Options **Step 2: Data** Step 3: Graph

x0	y0	x1	y1	x2	y2
1	1	1	3	1	2.54
2.2	4.84	1.3	3.9	2	5.08
3.3	10.89	2	6	2.7	6.858
4.4	19.36	2.6	7.8	3	7.62
5.5	30.25	3	9	3.1	7.874
6	36	3.2	9.6	3.4	8.636
7.5	56.25	4	12	3.8	9.652
8.8	77.44	4.8	14.4	4	10.16
9.5	90.25	5.1	15.3	4.3	10.922
10	100	6.11	18.33	4.7	11.938
		7.2	21.6	5	12.7
		8.3	24.9	6	15.24
		9.25	27.75	6.5	16.51
		10	30	7	17.78
				7.1	18.034
				7.2	18.288
				8	20.32
				9	22.86
				10	25.4

Curve interpolation:
☒ Linear
☐ Polynomial

Please select an Excel file: **Browse...** **Upload**

Choose File to Upload

Look in: Excel

- Curves.xls
- Curves_3.csv
- Curves_3.xls**
- Curves_3a.csv

2: select an XLS data file

1: Browse... button

3: Open button

4: Upload button

Next Step

webGraph: the resulting Graph

Step 1: Options Step 2: Data **Step 3: Graph**

My Test Graph

My Y-values (unit)

My X

Legend: y0, y1, y2

File Download

Do you want to open or save this file?

Name: graph.xml
Type: XML Document, 5.91 KB
From: www.nucleonica.net

Open **Save**

While files from the Internet can be useful, some files can harm your computer. If you do not trust the source, do not save this file. [What's the risk?](#)

Save Image **Save Configuration**

graph.xml - Notepad

File Edit Format View Help

```
<?xml version="1.0" encoding="utf-16"?>
<NucleonicaGraph>
  <Options>
    <ImageWidth>500</ImageWidth>
    <ImageHeight>400</ImageHeight>
    <LineStyle>LinewithSymbols</LineStyle>
    <Border>true</Border>
    <GraphBorder>true</GraphBorder>
    <Legend>true</Legend>
    <YAxisLog>false</YAxisLog>
    <YAxisMin>0</YAxisMin>
    <YAxisMax>0</YAxisMax>
    <YAxisAuto>true</YAxisAuto>
    <XAxisLog>false</XAxisLog>
    <XAxisMin>0</XAxisMin>
    <XAxisMax>0</XAxisMax>
    <XAxisAuto>true</XAxisAuto>
    <GraphTitle>My Test Graph</GraphTitle>
    <Category>My X-values (unit)</Category>
    <Value>My Y-values (unit)</Value>
    <MajorGridlinesX>true</MajorGridlinesX>
    <MinorGridlinesX>false</MinorGridlinesX>
    <MajorGridlinesY>true</MajorGridlinesY>
    <MinorGridlinesY>false</MinorGridlinesY>
    <TicksLocation>1</TicksLocation>
    <MajorStepX>-1</MajorStepX>
    <MinorStepX>-1</MinorStepX>
    <MajorStepY>-1</MajorStepY>
    <MinorStepY>-1</MinorStepY>
    <CurveInterpolation>0</CurveInterpolation>
  </Options>
  <Data>
    <DataSource>2</DataSource>
    <Titles>y0,y1,y2</Titles>
    <CURVES
      CurveNumber="3">
        <CURVE
          PointNumber="10">1,1,0;2.2,4.84,0;3.3,10.89,0;
        </CURVE>
        <CURVE
          PointNumber="14">1,3,0;1.3,3.9,0;2.6,0;2.6,7.8
        </CURVE>
        <CURVE
          PointNumber="19">1,2.54,0;2.5.08,0;2.7,6.858,0
        </CURVE>
      </CURVES>
    </Data>
  </NucleonicaGraph>
```

webGraph: Data from another Application

The screenshot displays the Nucleonica webGraph interface, which is divided into several sections. On the left, a table lists data points with columns x, y1, and y2. A red arrow points from the text "Copy & Paste" to the data table. Below the table, there are radio buttons for "Linear" and "Polynomial" curve interpolation, with "Linear" selected. At the bottom left, there is a field to "Please select an Excel file:" with "Browse..." and "Upload" buttons. On the right, the "Nucleonica Scripting" panel is visible, featuring tabs for "Source Editor", "Script Output", and "Print Preview". The "Source Editor" tab is active, showing a script for calculating y1 and y2. The "Script Output" tab is also visible, showing the same data points as the table. A "Next Step" button is located at the bottom right of the interface.

Step 1: Options Step 2: Data Step 3: Graph

x	y1	y2
0	0	0
1	2	1
2	4	4
3	6	9
4	8	16
5	10	25
6	12	36
7	14	49
8	16	64
9	18	81
10	20	100

Copy & Paste

Curves with the same X-values

Curve interpolation:
☒ Linear
☐ Polynomial

Please select an Excel file: Browse... Upload

Next Step

Nucleonica Scripting

Source Editor Script Output Print Preview

Note: To view a HTI

> Output

x	y1	y2
0	0	0
1	2	1
2	4	4
3	6	9
4	8	16
5	10	25
6	12	36
7	14	49
8	16	64
9	18	81
10	20	100

Source Editor Script Output Print Preview

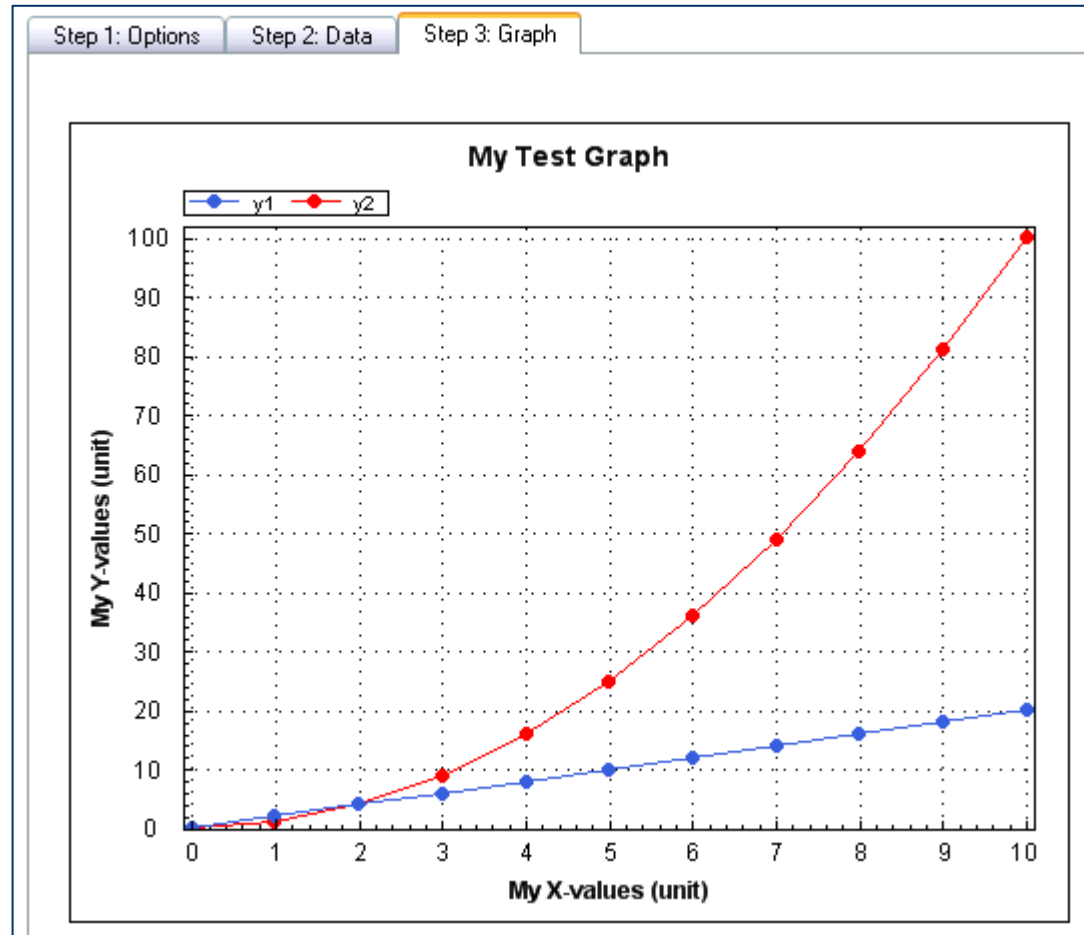
Import File Run Run in Background

Command line arguments:

> Source

```
int main()
{
    print("x, y1, y2");
    double x;
    for(x=0; x<=10; x=x+1)
    {
        print(ToString(x) + ", " + ToString(2*x) + ", " + ToString(x*x));
    }
}
```

webGraph: the resulting Graph



webGraph: Exercise

Exercise: Using Nucleonica's webGraph tool,

1.) Draw a graph with a curve given by the values from the grid:

x	0	1.0	2.0	3.0	4.0	5.0	6.0	7.0
y	0	3.1	5.9	8.1	9.5	10.0	9.5	8.1

2.) Add a graph title, set axis categories and units and show the major gridlines.

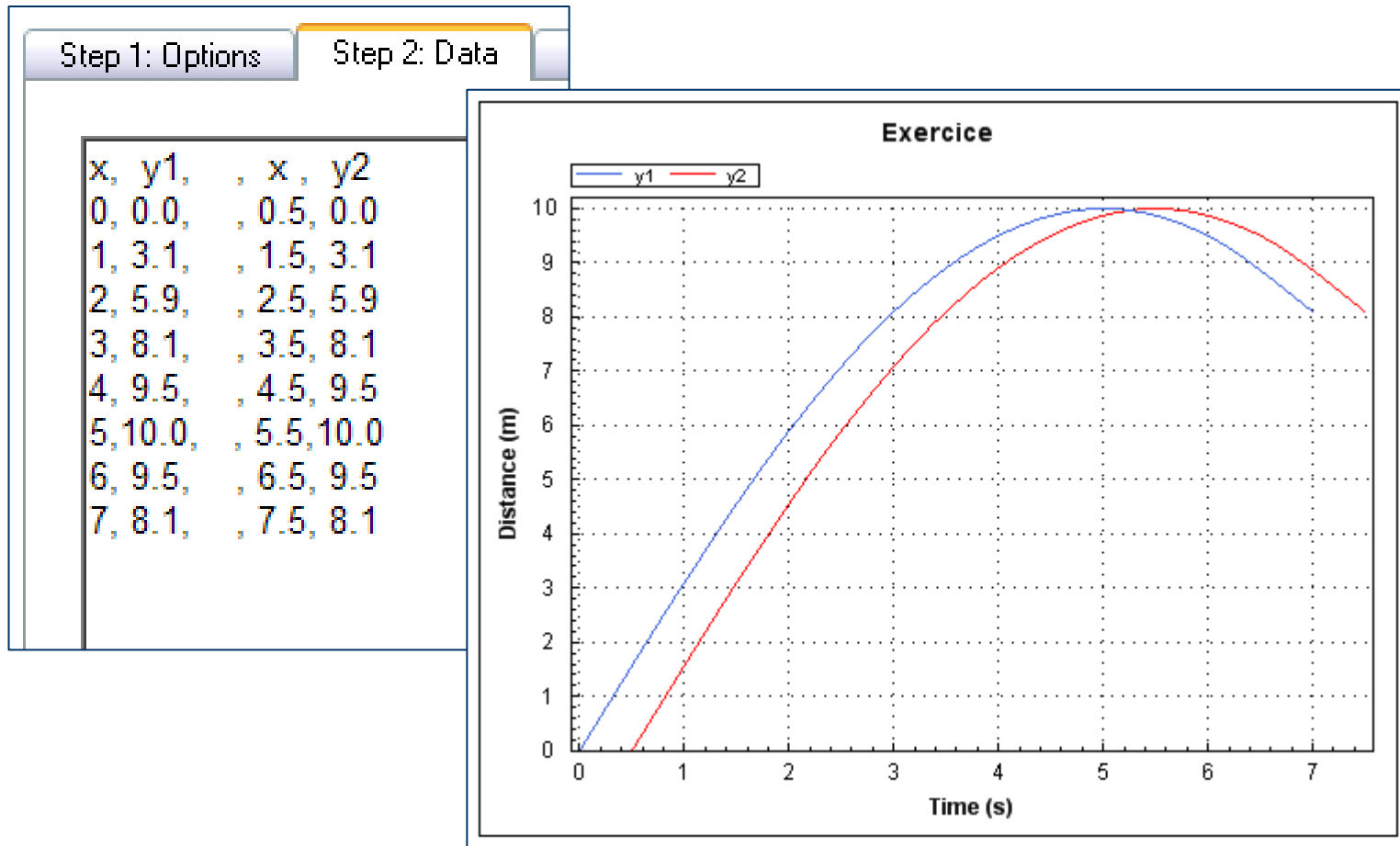
3.) Add a second curve (with different x-values) given by:

x	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5
y	0.0	3.1	5.9	8.1	9.5	10.0	9.5	8.1

4.) Use polynomial interpolation, change the legend and remove line symbols.

5.) Save the configuration

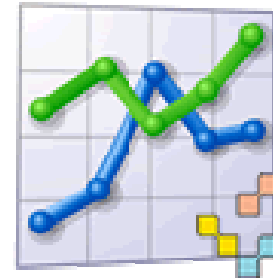
webGraph: Solution



webGrah in Nucleonica

1. webGraph overview

1. Graph settings
2. Data input
3. Up- and download data files
4. Download graph (Image format)



2. Exercise

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